



DEPARTMENT OF DEFENSE
STRATEGIC DEFENSE INITIATIVE ORGANIZATION
WASHINGTON, DC 20301-7100

JUN 2 1986

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MEMORANDUM FOR SPECIAL ASSISTANT FOR STRATEGIC DEFENSE
INITIATIVE HQ USAF RD-D

SUBJECT: Space Transportation and Support (STAS) Contracts

The first six months of the multi-agency STAS contractual efforts have concentrated on providing material to support preparation of the report to the National Security Council required by the NSSD. As the draft report is nearing completion, it is now appropriate for the Steering Group to consider how best to use the remaining 20 months of contractual effort. The next Steering Group Meeting should include this as an agenda item. In the interim, the SDI has several issues which need to be addressed.

As you are aware, SDI was initiating independent efforts similar to the STAS studies, that were terminated when the NSSD was issued last May. To date, our specific needs for technical and planning data have been only partially satisfied and I totally concur with critical review of the contractual efforts by the STAS Steering Group. Accordingly, I now request that the STAS contractors address a range of issues (Atch 1) of specific interest to SDI so we can be in an improved position to justify our budget requests to Congress and provide detailed architectural/cost data to our Systems Office for use by architecture contractors. I consider this request within the scope of the current contractual efforts and SDIO-provided funding since the majority of this effort should be a repackaging of information the contractors say is already available.

To effectively support the next phase of the SDIO System Architecture studies and enable us to evaluate the Transportation Technology Team recommendations anticipated in July, a written report (vice a briefing) in response to this tasking is required not later than 30 July 1986. In addition, it is my objective that space transportation architecture analyses in the SDI system architecture studies depend almost totally on the support/data

provided to them through the STAS structure. Accordingly, we will need by 1 Oct 86 a second report that consolidates the results of the STAS efforts to provide as government-furnished data to the winners of our forthcoming competition.

Thank you!
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Attachment

cc: Lt General Randolph
Rear Admiral Truly

JAMES A. ABRAHAMSON
LIEUTENANT GENERAL, USAF
DIRECTOR

SDIO ANALYSIS REQUIREMENTS

BACKGROUND

1. Four NASA and four DoD mission models are being used to drive the STAS analysis efforts. DoD Mission Model II contains significant SDI experimentation but supports no SDI deployment. DoD Mission Model III supports a major SDI deployment dominated by KEW. The study directors chose to have the contractors concentrate on DoD/NASA Models II/II with excursions to III/III. (NASA Model II supports Space Station and GEO servicing requirements.)

2. The STAS efforts to date have been marked by an apparent lack of technical and economic trade-off and sensitivity analyses. This shortcoming was highlighted by SDIO (Jan 86 memo to SAF/US) and recognized by the Steering Group during the April review at VAFB.

TASKING

1. Architectures and Technology investment recommendations optimized to specifically support a nominal KEW deployment are required. The additional architectural/systems and technology investment requirements needed to support Mission Models III/I, III/II and III/III should be identified for comparison. SDIO will provide a major revision of this nominal KEW deployment, if required, by 31 May 86 to support this activity.

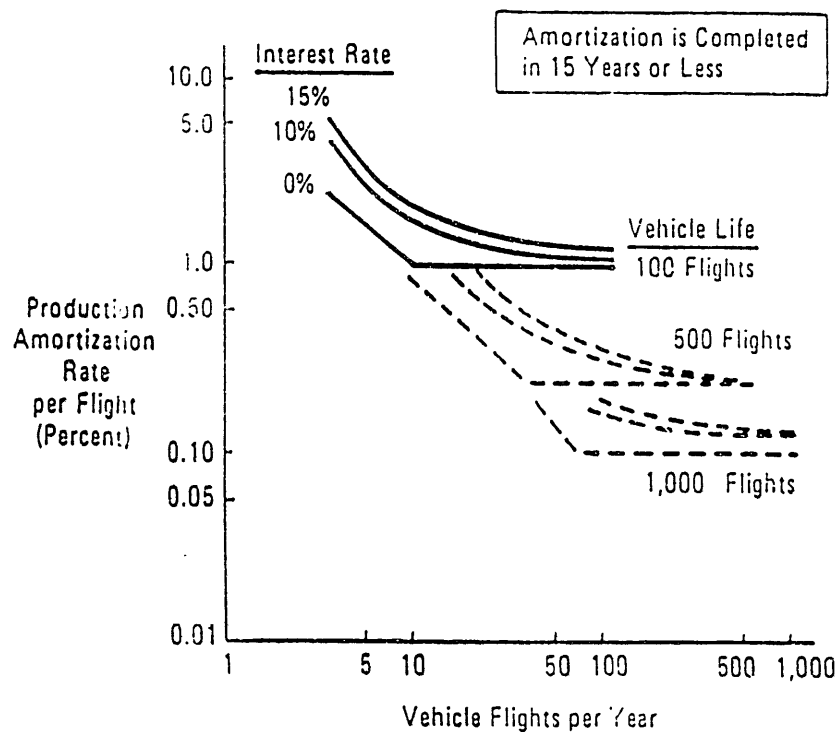
2. Economic and Technical trade-off and sensitivity analyses of the type illustrated in attachments 2, 3, and 4 shall be conducted and used to substantiate the recommendations in Item 1. Macro-economic analyses must be conducted that include cost/benefit assessments and detail assumptions with respect to the amortization of R&D and production costs and the discounting/non-discounting of outyear O&M savings. SDIO must have the data to demonstrate that the \$15-20B investments needed to support SDI can either be amortized in a reasonable period of time or justified on the basis of discounted outyear O&M savings. If these arguments cannot be made, alternate, non-economic arguments will have to be developed. A specific analysis of the sensitivity of variations in the KEW deployment rates and payload size/composition shall be conducted.

3. A more in-depth examination of ground processing operations should be conducted. Innovative payload and booster handling techniques need to be pursued. Trades between faster turnaround and larger fleets must be accomplished.

4. Assuming that some sort of fly-back booster emerges from the analyses from Item 1 above, the recommendation to avoid manning or man-rating this proposed fly-back booster is accepted. However, it does not appear that compelling arguments have been developed to satisfy the concerns over public safety associated with unmanned return of such boosters over populated areas.

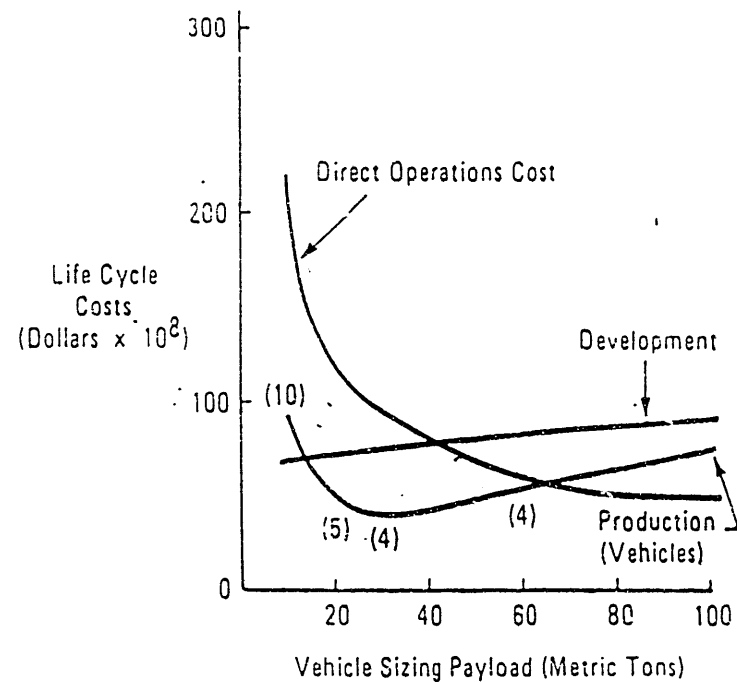
5. The government shall develop a position on the future of expendable launch vehicles; i.e., should technology investments and operations and maintenance improvements be applied to expendables or is the finding by one of the STAS contractors conclusive that ELVs are not cost competitive.

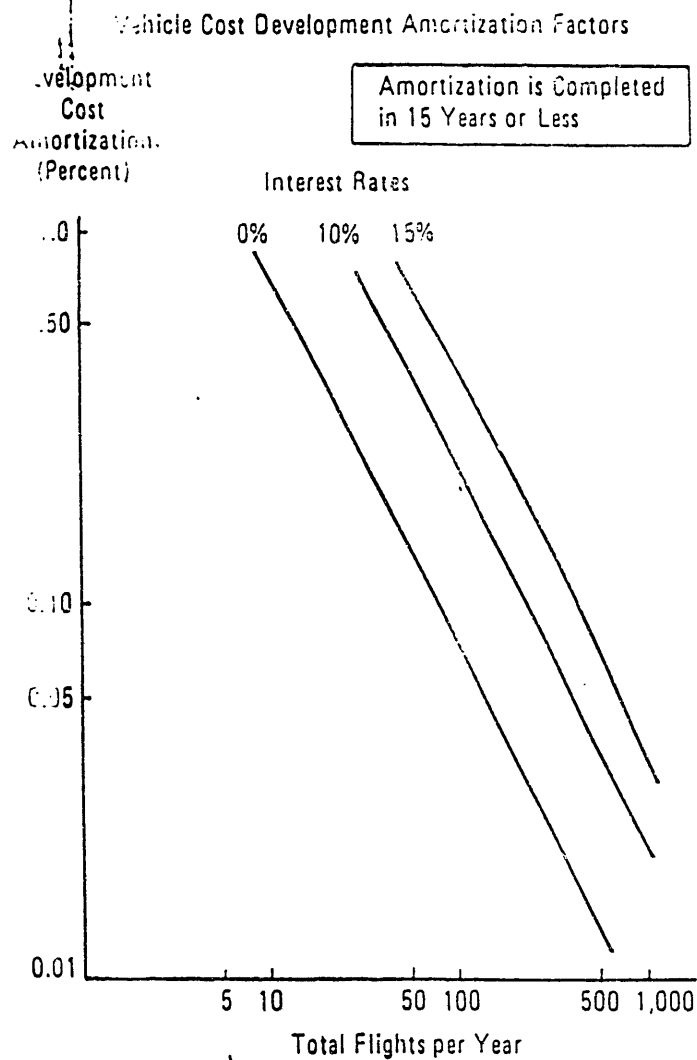
Vehicle Production Amortization Factors



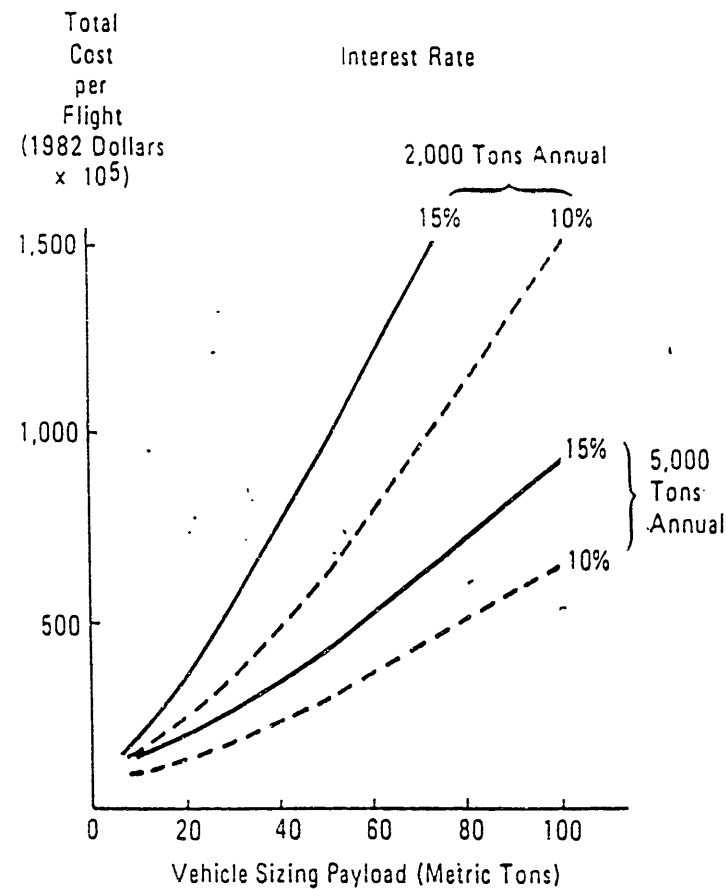
3,600 Tons Payload/Year, 15 Years of Operation
40 Flights/Vehicle/Year Capability

Min Total Life Cycle Cost - 60-ton Vehicle
Min Non-Recurring Cost - 30-ton Vehicle





Effect of Vehicle Size on Total Cost per Flight



Effect of Vehicle Size on Unit Payload Costs
at .5% Interest Rate

